AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Original) A radio frequency modulator, comprising:

a phase lock loop (PLL) having an input port for receiving a modulation signal and producing as an output signal a modulated RF signal at an output port;

a phase demodulator having an input port for receiving the modulated RF signal and having an output port for providing a phase information signal;

a comparator having a first input port for receiving the phase information signal and a second input port for receiving the modulation signal and an output port for providing an error signal; and

a pre-emphasis filter in response to receiving the error signal adjusts the modulation signal provided to the PLL.

2. (Original) A radio frequency modulator as defined in claim 1, wherein the pre-emphasis filter comprises a digital pre-emphasis filter.

3. (Original) A radio frequency modulator as defined in claim 1, further comprising a direct digital synthesizer (DDS) coupled between the pre-emphasis filter and the PLL.

4. (Original) A radio frequency modulator as defined in claim 1, wherein the PLL has a transfer function and the pre-emphasis filter preconditions the modulation signal with a filter response which is about the inverse of the PLL transfer function.

5. (Original) A radio frequency modulator as defined in claim 1, wherein the phase demodulator comprises a digital phase demodulator.

6. (Original) A radio frequency modulator as defined in claim 1, wherein the modulation signal comprises a digital modulation signal.

7. (Original) A method of producing a stable and low noise modulator, comprising the steps of:

(a) providing a phase lock loop (PLL) for receiving a modulation signal and producing a modulated RF signal;

(b) demodulating the modulated RF signal to produce a demodulated signal;

(c) comparing the demodulated signal with the modulation signal in order to provide an error signal; and

(d) using the error signal to precondition the modulation signal provided to the PLL using a pre-emphasis filter.

8. (Original) A method as defined in claim 7, wherein step (d) comprises preconditioning the modulation signal in the digital domain using a digital pre-emphasis filter.

9. (Original) A method as define in claim 7, wherein the PLL has a transfer function and the pre-emphasis filter has a filter response of about the inverse of the PLL transfer function.

10-19. (Canceled).

10. (Currently amended) A digital modulator for use in a radio frequency transmitter, comprising:

a phase-lock-loop (PLL) loop producing as an output signal a modulated RF signal;

a phase demodulator having an input port for receiving unmodified the modulated RF signal and having an output port for providing a phase information signal; and

a comparator having a first input port for receiving the ~~unmodified modulated RF~~ phase information signal and having an output port for ~~providing a~~ outputting an error ~~phase information~~ signal.

11. (Previously presented) A radio frequency modulator as defined in claim 1, wherein the modulation signal is subject to a phase delay prior to being input to the second input port of the comparator.

12. (Previously presented) A radio frequency modulator as defined in claim 1, wherein the phase lock loop (PLL) comprises a loop filter coupling a phase/frequency detector and charge pump to an oscillator.

13. (Previously presented) A radio frequency modulator as defined in claim 12, wherein the loop filter is a low pass filter.

14. (Previously presented) A radio frequency modulator as defined in claim 12, wherein the oscillator is a voltage controlled oscillator (VCO).

15. (Currently amended) A radio frequency (RF) modulator comprising:

a phase-lock-loop (PLL) loop including a loop filter and receiving as an input signal a modulation signal and producing as an output signal a modulated RF signal;

circuitry for receiving unmodified the modulated RF signal and outputting an error signal; and ~~producing an injection modulation signal;~~

~~circuitry for injecting the injection modulation signal into the phase lock loop at a point before the loop filter; and~~

circuitry responsive to said error signal ~~control circuitry, coupled to the circuitry for injectingon the injection modulation signal,~~ for controlling the amplitude of the ~~injection~~ modulation signal.

16. (Currently amended) The radio frequency (RF) modulator of claim 15, wherein said ~~control~~ circuitry for receiving unmodified the modulated RF signal and outputting an error signal comprises a phase demodulator coupled to receive the modulated RF signal.

17. (Currently amended) The radio frequency (RF) modulator of claim 16, wherein said ~~control~~ circuitry for receiving unmodified the modulated RF signal and outputting an error signal further comprises a comparison circuit coupled to the phase demodulator.

18. (Previously presented) A method of producing phase shifts in a modulated RF signal, comprising the steps of:

producing ~~an injection~~ modulated~~ion~~ RF signal;

receiving unmodified the modulated RF signal and outputting an error signal; and

controlling the amplitude of a modulation signal in response to the error signal.

~~injecting the injection modulation signal into a phase lock loop having a loop filter at a point before the loop filter; and~~

~~producing a modulated RF signal as an output from the phase lock loop.~~

19. (Currently amended) The method of claim 18, further comprising preconditioning the modulation signal in the digital domain prior to injection into ~~the~~ a phase lock loop.

20. (Previously presented) The method of Claim 19, wherein a pre-emphasis filter is used in preconditioning the modulation signal.